

REMARKS

Claims 1-47 were pending in the case. Claims 22-30 were objected to and the remaining claims rejected.

First, Applicants have added new Claim 48 which combines language of original Claim 1 and dependent Claim 22 and hence is allowable at least for the reasons indicated by the Examiner pertaining to Claim 22. Claim 48 is not exactly the same as the combination of Claims 21 and 22; the word "the" has been added before "compression software", "organizer software" and before "compressed image data". Also the phrase "in memory causing a microcontroller" has been deleted, although this was present in original Claim 21. Also, while original Claim 22 used the term "said", the word "the" has been substituted in Claim 48.

Claims 1-2, 4-20, and 31-46 stand rejected under 35 USC § 102(b) as anticipated by Kikinis et al. Claims 3 and 47 stand rejected under 35 USC § 103 as unpatentable over Kikinis et al. in view of Liebl et al. Claim 21 stands rejected citing Kikinis in view of Nahi et al.

The rejections under 35 USC § 102 of Claims 1-2, 4-20, and 31-46, as well as the rejection of Claims 3 and 47 and 21 under 35 USC § 103 are all traversed. For the reasons set forth below, it is respectfully submitted that these claims distinguish over the references.

Note that most of the claims earlier pending have been amended. However, these amendments are chiefly for reasons of form, not in response to any rejection, and not for reasons of patentability, and these amendments are not intended to narrow the scope of the claims except as expressly pointed out hereinafter.

In accordance with the invention, an expansion module which couples to a handheld computing device "PDA" (personal digital assistant) is provided. The expansion module has its own graphics engine but uses the microprocessor of the PDA to execute commands in one

embodiment. The expansion module is not in itself necessarily a computer, but is a graphics-type interface which allows the PDA, which stores presentation software and presentation data to display that presentation data, on a (large) external display such as monitor or television set. A typical example is using the PDA to display a PowerPoint presentation on a monitor. Note that typically PDAs are not able to output the VGA or similar type computer graphics used in a PowerPoint presentation; the expansion module provides the additional graphics engine which allows the use of the PDA for providing a PowerPoint-type presentation or similar graphics on the external display, e.g., monitor or television set. Hence the combination of the expansion module and the PDA effectively replace a computer for this purpose (such as a laptop or desktop computer) giving the PDA the possibility of use for intensive graphics purposes that typically PDAs by themselves do not have. Moreover, the expansion module is compatible with, in some embodiments, a plurality of standard interfaces such as the Springboard Port, Compact Flash types I and II, PCMCIA Type 2 Card, Secure Digital, and Memory Stick. A PDA is a species of handheld computer such as the well-known Palm Pilot. As pointed out in the present application at page 4, beginning line 16:

Unfortunately, a shortcoming of the Palm Pilot and computing devices of the like is that they can only support a limited number of functions in comparison to their larger counterparts, such as laptop computers. Unlike laptop and desktop computers, the current handheld portable computing devices do not include mass media storage units (e.g., hard disk drives) or high capacity memory devices that allow for the storage, retrieval and execution of one or more resource intensive software applications, such as the Microsoft PowerPoint.

Hence the present invention is directed to solving this technical problem using the expansion module configured to attach to the handheld computing device, such as a PDA.

Present Fig. 1 shows one embodiment of a system in accordance with this invention including three distinct subsystems, the first of which is the conventional handheld computing

system 110 (a PDA, for example), the second of which is the inventive expansion module 120, and the third of which is the conventional external display device 130 driven as shown by the external display controller 127 of the expansion module so that the external display device can display, for instance, graphics-type data such as that conforming to the VGA standard. Moreover, the present expansion module is also compatible with compression of the graphics data using a variety of compression techniques; see specification page 19. Hence the shortcomings of the handheld computing system 110 with respect to display of graphics are overcome by the expansion module 120. As illustrated, the handheld computing system 110 is typically a conventional device, such as the Palm Pilot, as is the external display device 130, typically a monitor or TV set. Inventive aspects in accordance with this system are typically provided in the expansion module 120 as recited, for instance, in Claim 1.

Hence it is respectfully submitted that the present claims distinguish over the references cited by the Examiner for at least the following reasons:

With regard to Kikinis et al., this reference is directed to (see Fig. 6) a host computer 66 connecting the host interface 14' to a "μPDA". See Kikinis et al., col. 4, beginning line 10, "Fig. 6 is a block diagram of a μPDA docked in a docking bay of a host computer according to an embodiment of the present invention." Hence to the extent that Kikinis et al. is relevant to the present invention, Kikinis et al. merely shows the well known use of a PDA docked to a host computer. There is no indication or suggestion that the μPDA is an "expansion module" in accordance with the present application. There is also no disclosure of any possibility of connecting the μPDA to drive an external display device. The μPDA is itself a handheld computing device having a microprocessor and clearly capable of performing the usual PDA functions. Note that a μPDA of the type of Kikinis et al. is, however, typically not capable of driving an external display with full graphics. See, for

instance, Kikinis et al. col. 7, beginning line 66, regarding the μ PDA of Fig. 6 which states at col. 8, beginning line 2, "In one embodiment I/O interface comprises an LCD display with a resolution of 256×144 pixels in a screen size that displays 32×12 characters ... In another embodiment, the pixel resolution is 320×200 , which corresponds to 40×16 characters."

Hence this is a typical small size character-type PDA display without full graphics capability and having a very small number of pixels; in contrast, a typical computer-type display for VGA graphics has 640×480 pixels. See, for instance, the present specification at page 28, lines 20-23. Clearly, therefore, Kikinis et al. does not disclose or even suggest driving such a display and moreover there is no suggestion of driving a display external to the μ PDA; instead, clearly, the display in Kikinis et al. is the small and unsophisticated built-in display in the μ PDA.

While not cited against Claim 1, the Nahi et al. reference is directed to a portable display tablet; see Nahi et al. col. 3, beginning line 56:

This is achieved through the use of a portable display tablet that is operated in conjunction with a base computer system, including a host processor for executing an application program with a predetermined operational function that generates predetermined graphics data and operates in response to predetermined input data. The computer system also includes a wireless data transceiver coupled to the processor that is capable of communicating the predetermined graphics and input data between the computer and portable display tablet. The portable display tablet comprises a graphics display panel for displaying predetermined graphical data ...

Hence the Nahi et al. disclosure is of a two part system, the host computer and the graphics display tablet which includes apparently a full function graphics display as its key element. See Nahi et al. col. 7, beginning line 64:

The display panel 32 is preferably an active matrix liquid crystal display (LCD) or dual-dash scan super-twist thematic display suitable for rendering color images at a resolution of about 640×480 pixels or greater ... In all events,

the display panel 32 is preferably light-weight, reasonably sturdy when an as mounted within the case 30, and suitable for the graphic display of at least computer video data.

Hence Nahi et al. is directed to a device with a large built-in display where, in fact, the point of the tablet is to serve as a display device. Hence there is no suggestion at all of a display external to the tablet and there would be no reason to substitute same. Hence, clearly, Nahi et al. does not disclose anything like the "expansion module" recited in present Claim 1.

Clearly, Claim 1 also distinguishes over Kikinis et al. first because Claim 1 recites "an expansion module". No such device is suggested in Kikinis et al., which instead discloses a μ PDA which is itself a handheld computing device. Hence there would be no reason to use the Kikinis μ PDA as recited in the preamble of Claim 1 "for controlling and displaying presentations stored in a handheld computing device" because, in fact, the Kikinis μ PDA is itself the handheld computing device. Moreover, Kikinis et al. clearly does not disclose (see above) the final feature recited in Claim 1 which is "a display controller operably connected to the memory and which converts the decoded image data to signals and is "connectable to an external device display." Note that while Claim 1 has been amended, these amendments are to improve its form and clarity and are not intended to narrow the claim or for purposes of patentability.

Clearly these features of Claim 1 are not disclosed or even suggested in Kikinis et al. (or in Nahi et al.). Those references are directed to different systems architectures. In brief, Kikinis et al. discloses a two-part system: the host computer and the μ PDA. Nahi et al. also discloses a two-part system: the host computer and the display tablet. Neither discloses the three-part system in accordance with Claim 1 having the handheld computing device, expansion module, and being "connectable to an external display device". Claim 1 clearly distinguishes over these references and hence is allowable. Dependent Claims 2-20 are allowable for at least their dependence upon Claim 1.

Independent Claim 21 was rejected citing Kikinis et al. in combination with Nahi et al. under section 103. Claim 21 has been amended, and it is respectfully submitted, distinguishes over these references even in combination. Specifically, Claim 21 has been amended to omit the language "compression software" and "organizer software" and instead these portions of the claim recite "compressing" and "storing". However, a final clause has been added to Claim 21 which recites "and attaching an expansion module to the handheld computing device for displaying the presentation data on an external display." Hence this is directed to a method, as described above, involving in combination the handheld computing device, expansion module and external display. No such system or method is suggested in Kikinis et al., or in Nahi et al., since as discussed above both disclose only two subsystems, not three. Kikinis et al. of course does not suggest use of any external display with his handheld computing device (μ PDA). Nahi et al., as an important part of his purported invention, incorporates the display in the graphics tablet. There is no suggestion in Nahi et al. to make the display a separate device, and to do that would substantially reduce the purported utility of the Nahi et al. invention. Hence Claim 21 as amended clearly distinguishes over these cited references, even in combination.

Claims 22-30 are allowable for at least their dependence upon base Claim 21. Note that Claim 22 has been amended to delete a substantial part of Claim 22 as originally filed, to conform to amended base Claim 21.

Claim 31 was rejected as anticipated by Kikinis et al. This rejection is traversed. The amendments here to Claim 31 are to improve its form and clarity and not for purposes of patentability and not to narrow the claim. Claim 31 is directed to the three part system and its method of operation as discussed above, and calls for in its preamble "A method for controlling and displaying presentations stored in a handheld computing system on an external display using an expansion module". Specifically, the body of Claim 31 calls for

“processing presentation data stored in the handheld computing system ... forwarding the process presentation data to a display controller of the expansion module; converting the presentation data to signals for rendering images on the external display by the display controller.” Note that Claim 31 as originally filed was perhaps not in conformance with the other claims by indicating that the display controller was in the handheld computing system when, in fact, the relevant “display controller” in accordance with Claim 31 as amended is in the expansion module.

In any case, Claim 31 is clearly directed to a method of the type carried out by the three part system as discussed above, for instance, in conjunction with Claim 1, and clearly is not met by Kikinis et al. and is also not met by Nahi et al. by itself or even in combination with Kikinis et al. Hence Claim 31 is allowable as are dependent Claims 31-40.

Claim 47 is another independent method claim and again is directed to the three component system and the accompanying mode of operation discussed above, including “executing a first control software on the computer to transfer the presentation data base to a first handheld computing device; and executing a second control software running on the first handheld computing device to transfer the presentation data base to a second handheld computing device which processes the image data, included in the presentation data base, and displays the image data on a display device external to the second handheld computing device.” Claim 47 has been amended to recite the display device being “external to the second handheld computing device” and hence the method of Claim 47 has the same advantages as discussed above in conjunction with, for instance, the system of Claim 1 and similarly distinguishes over Kikinis et al., as well as Nahi et al., which do not suggest or disclose such a method.

Claim 41 recites a method of loading program code and in this respect differs from the other claims. Claim 41 reads on, for instance, Figs. 7, 8 and 9. This method allows transfer

of program code from, for instance, the handheld computing system 110 in Fig. 1 to the expansion module 120 for execution by the microcontroller/ microprocessor present (in certain embodiments) in the expansion module. See Fig. 6 showing this embodiment of the expansion module with a microcontroller 125. The Examiner rejected Claim 41 as anticipated by Kikinis et al. but provided no analysis of how Kikinis et al. anticipates Claim 41. It is respectfully submitted that perhaps the Examiner lumped Claim 41 together with other of the claims and disregarded certain features of Claim 41, specifically that Claim 41 calls for “the handheld computing system fetching the program code from the memory in the handheld computing system; embedding the fetched perform code and instructions; forwarding the instructions to the communication interface; storing the instruction in the register; and transferring the instruction to the memory in the expansion module.” As pointed out above, there is no “expansion module” in Kikinis et al.; instead, there is a μ PDA. Moreover, in Kikinis the code, if transferred at all, does not transfer from a handheld computing system to an expansion module, but from a host computer to the μ PDA. There is no suggestion in Kikinis et al. that the host computer might be a handheld computing system. For instance, in Kikinis et al. Fig. 6, host computer 66 is shown as including mass storage device 28 which is identified as, for instance, a hard disk drive; see Kikinis et al. col. 10, lines 65 and 66. Of course, handheld computing devices, as discussed above, typically do not include disk drives. Hence, not only does Kikinis et al. not meet Claim 41, there appears to be no motivation to modify the disclosure of Kikinis et al. to meet Claim 41 and so Claim 41 distinguishes thereover, as do dependent Claims 42-46.

Therefore it is respectfully submitted that this case is allowable and it is requested that it pass to issue with all of Claims 1-48 allowed. If the Examiner contemplates other action, please contact the undersigned at 408/453-9200.

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APPENDIX A - Changes to the Claims

1. (Amended) An expansion module for controlling and displaying presentations stored in a handheld computing device having an expansion slot, a microcontroller, and system memory, [said] the expansion module comprising:

a communication interface which attaches [for attaching] the expansion module to the [handheld computing device's] expansion slot; the [said] expansion slot providing access to the handheld computing device's microcontroller's address and data space;

memory operatively connected to the communication interface and which stores [for storing] control software and image data, the microcontroller [executing control software to decode] decoding the image data before the image data is forwarded to the expansion module via the expansion slot; and

[an external] a display controller operatively coupled to the memory and which converts the [for converting] decoded image data to [electronic] signals [for delivery] and is connectable to an external display device.

2. (Amended) The expansion module of claim 1, wherein the communication interface is [implemented as] an application specific integrated circuit (ASIC).

3. (Amended) The expansion module of claim 1, wherein the communication interface is [implemented as] a field programmable gate array (FPGA).

4. (Amended) The expansion module of claim 1, wherein the communication interface converts the image data decoded by the microcontroller to a format [that meets the requirements] of the [external] display controller.

5. (Amended) The expansion module of claim 4, wherein the communication interface is a [16-bit to 32-bit data] multiplexor.

6. (Amended) The expansion module of claim 1, wherein the expansion slot is a [68-pin] Springboard connector.

7. (Amended) The expansion module of claim 1, wherein the memory [for storing] which stores control software and image data is flash ROM [memory].

8. (Amended) The expansion module of claim 7, wherein when the expansion module is attached to the handheld computing device, the flash ROM [memory] is recognized as an extension of the handheld computing device system memory.

9. (Amended) The expansion module of claim 1, wherein the external display controller is configured to query the external display device for display requirements and to convert decoded image data to electronic signals that match the [external] display requirements.

10. (Amended) The expansion module of claim 1, wherein the [external] display controller includes a memory buffer for temporarily storing decoded image data.

11. (Amended) The expansion module of claim 1, wherein the handheld computing device communicates with the expansion module [using wireless technology] wirelessly.

12. (Amended) The expansion module of claim 1, further comprising an external memory interface for [allowing] an external memory to attach to the expansion module.

15. (Amended) The expansion module of claim 1, further comprising a graphic transmitter for converting parallel digital output generated by the [external] display controller to serial digital output.

16. (Amended) The expansion module of claim 1, further comprising a microcontroller for decoding the image data [independent from the handheld computing device's microcontroller].

17. (Amended) The expansion module of claim 1, further comprising a connector [for connecting] to a power source.

19. (Amended) The expansion module of claim 17, wherein the power source is a [feedback power] line from the external display device.

20. (Amended) The expansion module of claim 1, wherein [the] execution of the control software [can be] is remotely controlled [by a remote control system].

21. (Amended) A method for loading a presentation on a handheld computing device, comprising:

writing image data to a driver[, the driver including data compression and presentation organizer software];

invoking the driver [compression software] to compress the image data;

invoking the driver [organizer software] to store the compressed image data in a presentation database; [and]

executing control software [in memory causing a microcontroller] to transfer the presentation database to the handheld computing device; and

attaching an expansion module to the handheld computing device for displaying the presentation data on an external display.

22. (Amended) The method of claim 21[, wherein said handheld computing device is attached to an expansion module for displaying the presentation data on an external display, said] the handheld computing [system] device having a first memory, and [said] the expansion module having a second memory.

25. (Amended) The method of claim 22, wherein the control software is [executed] in the first memory.

26. (Amended) The method of claim 22, wherein the control software is [executed] in the second memory.

27. (Amended) The method of claim 21 [22], wherein the control software [microcontroller] is [included] executed in the handheld computing device.

28. (Amended) The method of claim 21 [22], wherein the control software [microcontroller] is [included] executed in the expansion module.

29. (Amended) The method of claim 21 [22], further comprising:

decoding the image data included in the presentation database and forwarding it to [an external display controller in] the expansion module.

30. (Amended) The method of claim 29, further comprising:

[the external display controller] converting the decoded image data to [electronic] signals for delivery to an external display device.

31. (Amended) A method for controlling and displaying presentations stored in a handheld computing system on an external display using an expansion module, [said] the method comprising:

executing control software stored in the handheld computing system [system's memory via a microcontroller in the handheld computing system];

displaying a control interface on the handheld computing system [display];

processing presentation data stored in the handheld computing system [system's memory], in response to user interaction with the control interface;

forwarding the processed presentation data to [the handheld computing system's external] a display controller of the expansion module; and

converting the presentation data to [electronic] signals for rendering images on [an] the external display [device via] by the [external] display controller.

32. (Amended) The method of claim 31, wherein the handheld computing system comprises a handheld computing device and an expansion module attached to the handheld computing device; [said] the expansion module [for] providing communication [means] between the handheld computing device and [an] the external display device.

33. (Amended) The method of claim 32, wherein [the] a microcontroller for executing the control software is included in the handheld computing device.

34. (Amended) The method of claim 32, wherein the microcontroller for executing the control software is included in the expansion module.

37. (Amended) The method of claim 36, further comprising:
rearranging a display order of slides in the slide show by moving a box representing a slide in a first display position to a second display position.

38. (Amended) The method of claim 37, further comprising:
setting the length of the slide show by interacting with a [preference] menu provided by the control interface.

41. (Amended) A method of loading program code from memory in a handheld computing system onto [on-chip] memory [in an external] associated with a microcontroller in an expansion module; a communication interface connecting the expansion module and the handheld computing system, [said] the communication interface having a register, [said] the method comprising:

the [external] microcontroller initiating a read from the register;
the communication interface signaling a wait to the [external] microcontroller;
the communication interface submitting a request to receive the program code from the handheld computing system;
[a microcontroller in] the handheld computing system fetching the program code from the memory in the handheld computer system;

embedding the fetched program code in an instruction;
forwarding the instruction to the communication interface; [and]
storing the instruction in the register; and
transferring the instruction to the memory in the expansion module.

42. (Amended) The method of claim 41, further comprising:
the communication interface releasing the wait signal; and
the [external] microcontroller processing the instruction stored in the register
to determine how to handle the program code embedded in the instruction [therein].

43. (Amended) The method of claim 42, wherein the instruction includes a
function, the program code, and a memory address in the [on-chip] memory in the expansion
module, [said] the method further comprising:

if the function is a load function then storing the program code in the memory
address; and

if the function is a jump function then executing the program code stored in the
[on-chip] memory in the expansion module starting at the memory address.

44. (Amended) The method of claim 43, wherein the [external] microcontroller
executes the program code stored in the [on-chip] memory in the expansion module, further
comprising:

the [external] microcontroller initiating a read from the register;
the communication interface signaling a wait to the [external] microcontroller;
the communication interface submitting a request to receive data from the

handheld computing system;

[a microcontroller in] the handheld computing system fetching data from the memory in the handheld computer system;
embedding the fetched data in an instruction;
forwarding the instruction to the communication interface; and
storing the instruction in the register.

45. (Amended) The method of claim 44, further comprising:
the communication interface releasing the wait signal; and
the program code executed by the [external] microcontroller decoding the data.

47. (Amended) A method for displaying a presentation on a display device,
comprising:

creating image data using presentation software;
compressing the image data [created by one or more presentation software];
storing the compressed image data in a presentation database on a [desktop]
computer;
executing a first control software [running] on the [desktop] computer to
transfer the presentation database to a first handheld computing device; and
executing a second control software running on the first handheld computing
device to transfer the presentation database to a second handheld computing device
which processes the [capable of processing] image data included in the presentation
database and [displaying said] displays the image data on a display device external to
the second handheld computing device.